

ATHALIA LONGIFOLIAE SP. REV., STAT. NOV., NEW FOR THE
NETHERLANDS AND GERMANY (HYMENOPTERA: TENTHREDINIDAE)

Ad Mol

Athalia longifoliae is removed from synonymy with *A. circularis* and is upgraded to the species level from *A. circularis* ssp. *longifoliae*. The species is recorded for the first time for the Netherlands (19 localities) and for Germany (one locality). Differences between *A. longifoliae* and *A. circularis* are described and some notes on the ecology of *A. longifoliae* are given. In the Netherlands *A. longifoliae* was found only in a few limited areas where its host, *Veronica longifolia* grows, whereas *A. circularis* is common throughout the Netherlands. As both taxa occur within the same geographical area, do not interbreed and occupy their own ecological niche, there is no reason to treat *A. longifoliae* as a subspecies of *A. circularis*.

INTRODUCTION

The sawfly *Athalia longifoliae* Kontuniemi, 1951 (fig. 1, 2) was described from Finland, after an unknown number of females. The material was reared from larvae found on *Veronica longifolia*.

Since then, different opinions on this species have been published. Already three years after its description, Benson (1954) synonymized *A. longifoliae* with *A. lineolata* Lepeletier, 1823



Figure 1-2. *Athalia longifoliae* (the Netherlands), ventral view, 1. male, 's-Hertogenbosch, along canal, 19.vii.1997, 2. female, Gemonde, along river Dommel, 15.vii.1996.

Figuur 1-2. *Athalia longifoliae* (Nederland), onderzijde, 1. mannetje, 's-Hertogenbosch, Drongelens afwateringskanaal, 19.vii.1997, 2. vrouwtje, Gemonde, langs de Dommel, 15.vii.1996.



Figure 3. *Veronica longifolia*, the Netherlands, Gramsbergen, along river Vecht, 26.vi.2009. Photo Tineke Cramer.

Figuur 3. Lange ereprijs *Veronica longifolia*, Gramsbergen, langs de Overijsselse Vecht, 26.vi.2009. Foto Tineke Cramer.

(= *A. circularis* (Klug, 1815)). Hellén (1955) and again Benson (1962) confirmed this synonymy after studying the type of *A. longifoliae*. Lorenz & Kraus (1957), however, mentioned *A. longifoliae* as a species in their key of larvae. Muche (1962) disagreed with their view, postulating that *A. longifoliae* should be regarded as a colour form of *A. circularis* only. Chevin (1969) revised the French species of *Athalia*. In his view, *A. circularis* appears to be a polymorphic species, with *longifoliae* being part of the complex. Chevin described the male of *longifoliae* for the first time and gave a redescription of the female after additional material from France. For unknown reasons, however, he preferred ranking *longifoliae* as a subspecies of *A. circularis*. Lacourt (1978, 1985) briefly discussed the taxonomy of *A. circularis* and accepted the status of *A. longifoliae* as a subspecies. But in his overview of European Tenthredinidae, Lacourt (1999) regarded *A. longifoliae* as a synonym of *A. circularis* without any discussion. Liston (1995) listed *A. longifoliae* as a separate species in his compendium of European sawflies, but Taeger et al. (2006) in their list of European sawflies do not mention *A. longifoliae*.

THE NETHERLANDS

In 1996, I discovered some males and females of *Athalia* in the province of Noord-Brabant, flying around *Veronica longifolia*. These specimens agreed with Chevin's description of *Athalia circularis longifoliae* in every respect. Since then, 69 ♂ and 20 ♀ of this taxon have been collected on *Veronica longifolia* (fig. 3) on 19 localities in the Netherlands and one locality in Germany (fig. 4). All localities are listed in table 1. The specimens were compared with material of the *A. circularis*-complex, collected on about 30 other localities across the Netherlands (fig. 5).

STATUS

For reasons discussed below, these findings lead to the conclusion that *A. longifoliae* and *A. circularis* have to be treated as different species, not as synonyms or subspecies. The following taxonomical change is proposed therefore:

Athalia longifoliae sp. revocata; stat. nov.

A. longifoliae is removed from synonymy with *A. circularis* and upgraded from *A. circularis* ssp. *longifoliae*.

- *Veronica longifolia*
- *Athalia longifoliae*
- ★ vindplaats Duitsland

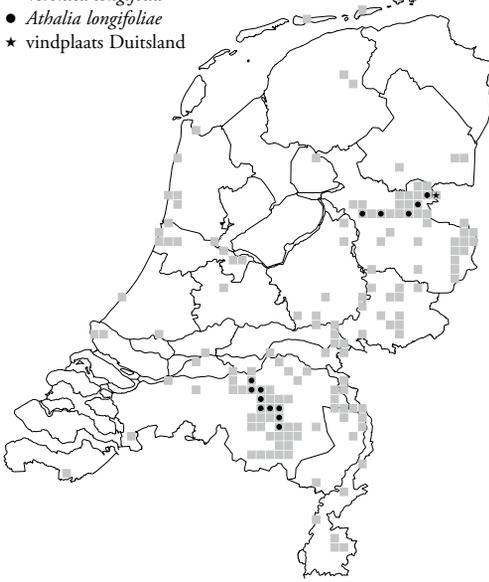


Figure 4. Records of *Athalia longifoliae* in the Netherlands and Germany, together with the known records of *Veronica longifolia*. Source FLORON.
 Figuur 4. Vondsten van *Athalia longifoliae* in Nederland en Duitsland, samen met de bekende vindplaatsen van lange ereprijs *Veronica longifolia*. Bron FLORON.



Figure 5. Records of *Athalia circularis* in the Netherlands.
 Figuur 5. Vindplaatsen van *Athalia circularis* in Nederland.

CHARACTERISTICS OF THE *A. CIRCULARIS* COMPLEX

Males and females of *A. longifoliae* largely resemble *A. circularis* in their size, appearance and colour. Both taxa together can be distinguished from the other northwestern European species of *Athalia* by the combination of entirely yellow middle tibiae and a largely yellow first tergite. Moreover, most specimens of *A. circularis/longifoliae* can readily be recognized by a horizontal black band on the mesopleura (fig. 1, 2), whereas the mesopleura are either completely yellow or black in other *Athalia* species. In *A. circularis* this character may vary to some extent, as sometimes specimens are found with the mesopleura nearly black or entirely yellow. The study of a series of 380 ♂ and 110 ♀ of *A. circularis*, collected by means of a Malaise trap in 1990 in 'De Brand' near Udenhout (Mol 1996) and 37 ♂ and 48 ♀

from a Malaise trap in 1998 in 'De Kaaistoep' near the city of Tilburg, revealed that this variation occurs within single populations of *A. circularis*. The material of *A. longifoliae* on the other hand shows very little variation in this respect. All specimens studied show a sharply bordered black mesopleural band, except for a single male with nearly entirely yellow mesopleura.

Apart from *A. longifoliae* and *A. circularis*, I have seen two females from the Netherlands with completely black mesopleura. They resemble the third taxon of the *A. circularis*-complex that was distinguished by Kontuniemi (1951) and Chevin (1969) as *A. cordatoides* Priesner, 1928 or *A. circularis* ssp. *cordatoides*. This taxon has been synonymized with *A. circularis* by the authors mentioned in the introduction as well. Judging from some small

Locality	Date	Co-ordinates	Specimens
<i>The Netherlands</i>			
<i>Overijssel</i>			
Gramsbergen, along river Vecht	26.vi.2009	240.8-514.3	1 ♂
3,5 km S of Hardenberg, along river Vecht	2.vii.2001	236.6-505.9	1 ♂
3 km S of Hardenberg, along river Vecht	2.vii.2001	236.8-506.6	1 ♂
2 km S of Hardenberg, along river Vecht	2.vii.2001	236.9-507.2	2 ♂
Bridge near Hardenberg	2.vii.2001	238.5-508.7	3 ♂
Bridge near Mariënberg, along river Vecht	2.vii.2001	234.9-504.2	1 ♂
Railway bridge near Zwolle, along river Vecht	12.vii.2003	208.3-504.0	1 ♂, 1 ♀
2 km E of Dalfsen, along river Vecht	12.vii.2003	215.8-502.0	1 ♀
<i>Noord-Brabant</i>			
Vught, along channel	13.vii.1997	147.0-408.6	3 ♂
's-Hertogenbosch, along canal	19.vii.1997	148.2-410.0	3 ♂
Sint-Michiëlsgestel, along river Dommel	13.vii.1997	152.4-405.2	2 ♂
Gemonde near Sint-Michiëlsgestel, along river Dommel and an isolated oxbow nearby	31.v.1998	151.8-403.4	3 ♂
[idem]	19.vi.1997	[idem]	4 ♂, 3 ♀
[idem]	13.vii.1996	[idem]	3 ♂, 1 ♀
[idem]	15.vii.1996	[idem]	11 ♂, 5 ♀
[idem]	18.viii.1996	[idem]	3 ♂, 2 ♀
Boxtel, near crossing of highway A2 and railway	20.vii.1997	153.0-399.1	1 ♂
Valley of river Dommel, 2 km NE of Liempde	20.vii.1997	155.2-399.2	3 ♂
[idem], 1.5 km E of Liempde	20.vii.1997	155.8-398.2	3 ♂
3.5 km E of Liempde	27.vi.1998	157.6-397.8	3 ♂
Sint-Oedenrode, valley of river Dommel	19.vi.1997	161.8-397.0	1 ♂
[idem]	12.vii.1997	[idem]	3 ♂
1.5 km south of Nijnsel, along river Dommel	12.vii.1997	162.3-394.5	9 ♂, 5 ♀
Nederwetten, along river Dommel	18.viii.1996	163.6-389.0	3 ♂, 2 ♀
<i>Germany</i>			
<i>Niedersachsen</i>			
Nieder-grafschaft Bentheim, Laar, along river Vechte	26.vi.2009	N 52°61.173'-E6°73.749'	1 ♂

Table 1. Records of *Athalia longifoliae* in the Netherlands and Germany. All material leg. and col. A.W.M. Mol; the Dutch co-ordinates refer to the Dutch Amersfoort-grid.

Tabel 1. Vindplaatsen van *Athalia longifoliae* in Nederland en Duitsland. Al het materiaal leg. en col. Ad Mol; de Nederlandse coördinaten in Amersfoortgrid.

series of specimens I collected in the French and Italian Alps, this synonymy may be unjustified. However, as both Dutch specimens represent isolated records, without males or other females

from the same population, it is not possible to decide whether they really belong to this taxon or may be extreme dark specimens of *A. circularis*.

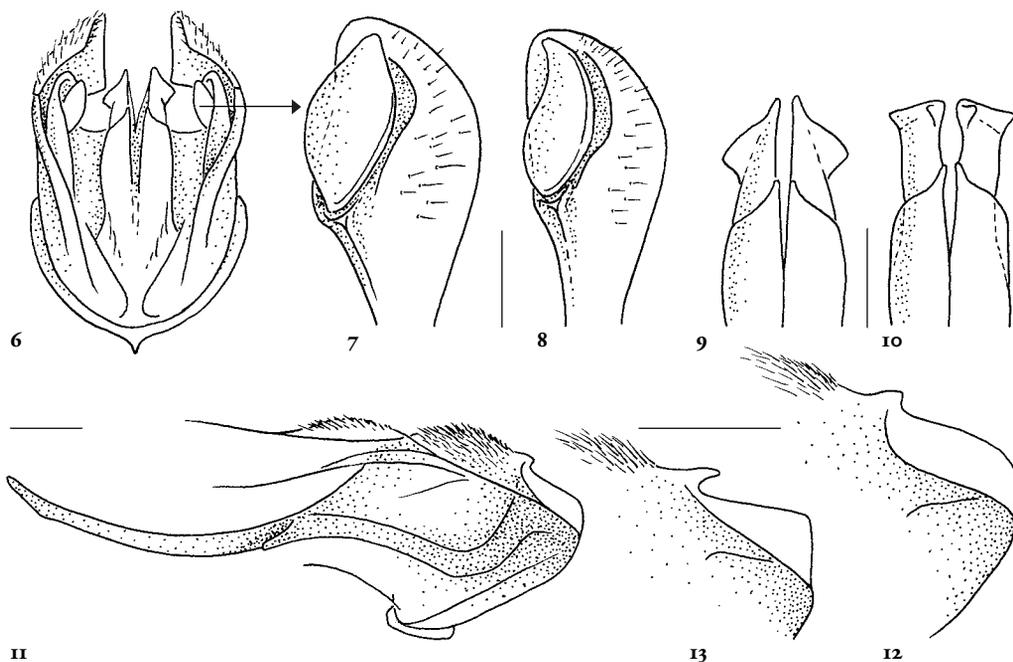


Figure 6-13. Male genitalia, 6. *Athalia longifoliae* overview, ventral view, 7-8. digitus and apical part volsella, 7. *A. longifoliae*, 8. *A. circularis*, 9-10. apex penis valve, ventral view, 9. *A. longifoliae*, 10. *A. circularis*, 11-13. Penis valve, lateral view. 11. *Athalia longifoliae* overview, 12-13. detail apex, 12. *A. longifoliae*, 13. *A. circularis*. Scale lines: 0.1 mm.

Figure 6-13. Mannelijke genitalia, 6. *Athalia circularis* overzicht, onderzijde, 7-8. digitus en tophelft volsella, 7. *A. longifoliae*, 8. *A. circularis*, 9-10. apex penisvalve onderzijde, 9. *A. longifoliae*, 10. *A. circularis* 11-13. Penisvalve, zijaanzicht. 11. *Athalia longifoliae* overzicht, 12-13. detail apex, 12. *A. longifoliae*, 13. *A. circularis*. Maatstreepjes: 0,1 mm.

RECOGNITION

Males of *A. longifoliae* and *A. circularis* can be separated by the shape of the genitalia only. The most striking difference is found in the shape of the inner movable part of the volsella, called digitus (after Laidlaw Smith (1970)). In *A. longifoliae* the digitus is shaped as a platelike rhomboid structure (fig. 7). In *A. circularis* the digitus is more slender, tapering towards the apex with the outer margin convex and the inner margin concave (fig. 8). When the genitalia are pulled out with a pair of fine pincers, this character may even be observed in the field using a handlens of 10 times magnification. The penis valves show several small differences. In *A. longifoliae* the valves are tapering towards the apex in ventral

view (fig. 9); in *A. circularis* the apex has more or less parallel sides and a blunt apex (fig. 10). In lateral view the apex of the penis valves is rounded in *A. longifoliae* and the subapical process is rather short (fig. 12); in *A. circularis* the apex is more angular shaped and the subapical process is longer and more slender than in *A. longifoliae* (fig. 13).

Females are more difficult to separate. The only reliable character appears to be found in the shape of the sawteeth. In *A. longifoliae* the sawteeth have a very fine denticulation and rather small smooth intersections between the sawteeth (fig. 14). Sawteeth of *A. circularis* have less denticles, the denticulation is more coarse and the intersections between the teeth are relatively

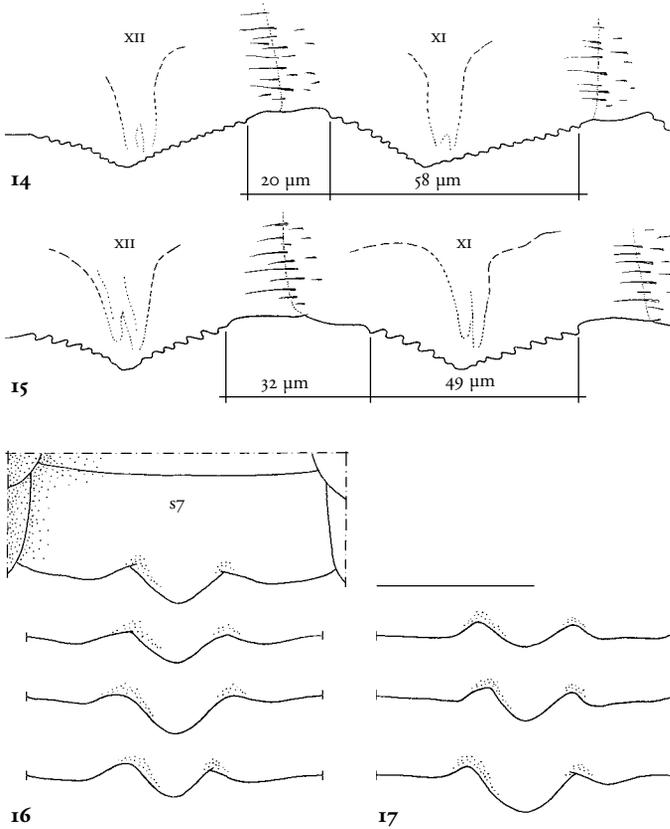


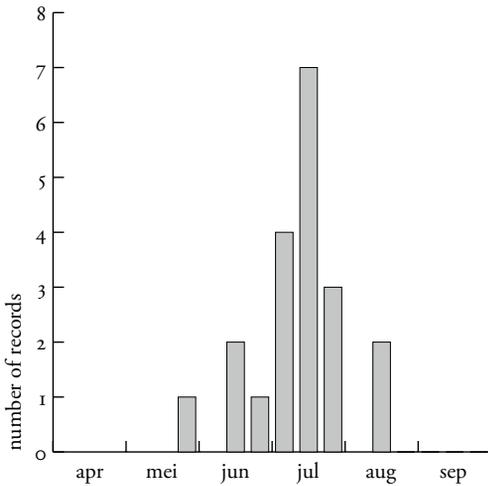
Figure 14-17. Female genitalia. 14-15. saw teeth XI-XII, 14. *Athalia longifoliae*, 15. *A. circularis*, 16-17. hypopygium (= sternite 7), posterior margin, 16. *Athalia longifoliae* (4 different females), 17. *A. circularis* (3 different females). Scale line fig. 16-17: 0.5 mm. Figuur 14-17. Vrouwelijke genitalia, 14-15. zaagtanden XI-XII, 14. *Athalia longifoliae*, 15. *A. circularis*, 16-17. achterrand hypopygium (= sterniet 7), 16. *Athalia longifoliae* (4 verschillende vrouwtjes), 17. *A. circularis* (3 verschillende vrouwtjes). Maatstreepje fig. 16-17: 0,5 mm.

larger than in *A. longifoliae* (fig. 15). These differences, which already have been reported by Kontuniemi (1951) and Chevin (1969), are best observed in the middle section of the saw, for example in teeth XI and XII. Sometimes it is difficult to distinguish between both species as wearing of the saw may cause some damage to the sawteeth. Chevin (1969) mentions a difference in the shape of the hypopygium between *A. longifoliae* and *A. circularis* as well. This difference could not be confirmed for the Dutch material. Both species show some variation in this respect and the characters overlap (fig. 16-17). Kontuniemi (1951) mentioned a difference in the colour of the clypeus between *A. longifoliae* and *A. circularis*, but according to Chevin (1969) this difference may be due to variation. The Dutch material confirms Chevin's conclusion.

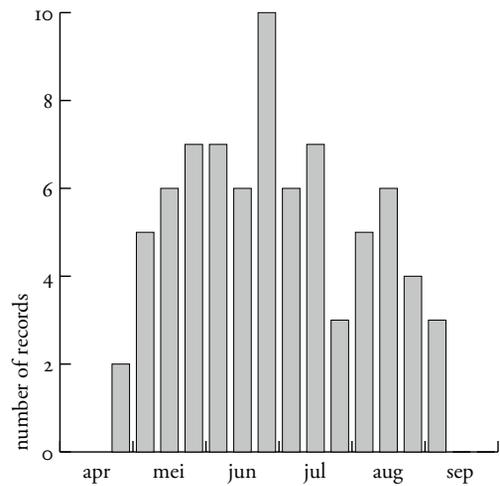
ECOLOGY

Adults of *A. longifoliae* were collected between May 31 and August 18. Although the number of data is rather limited, figure 18 indicates that only a single generation occurs with a peak in July. The known Dutch data for *A. circularis* show a longer flight period, from April 28 to September 8 (fig. 19) and perhaps some overlapping generations.

All males and females of *A. longifoliae* were observed sitting on *Veronica longifolia* or swarming around this plant within a distance of only one or two meters. Males appeared to be much more active than females as they were always observed flying around the plants, never sitting still for more than a few seconds. Most females were found while sitting still or walking quietly



18



19

Figure 18-19. Flight period in the Netherlands, 18. *Athalia longifoliae*, 19. *A. circularis*.

Figuur 18-19. Vliegtijd in Nederland, 18. *Athalia longifoliae*, 19. *A. circularis*.

around on the leaves of the host plant. Oviposition behaviour, as well as the egg structure and the larva, have been described in detail by Kontuniemi (1951).

Both males and females were often found relatively close to the soil. Although the flowers of *Veronica longifolia* are frequently visited by bumblebees, honeybees and various Diptera, no adults of *A. longifoliae* were ever observed on the flowers of this plant.

The list of host plants of *A. circularis*, on the other hand, is rather diverse. Taeger et al. (1998) mention ten different plant species, although a number of these need confirmation. The most reliable records may be *Veronica beccabunga* (Pasteels 1945), *Veronica officinalis* (Kontuniemi 1951) and *Glechoma hederacea* (Weiffenbach 1985) as they originate from primary sources. It may be noteworthy that I never found adults of *A. circularis* on *Veronica longifolia*, although they sometimes share the same habitat. This was illustrated by an observation near the railway bridge crossing the river Vecht near Zwolle. A male of *A. circularis* was swept from a vegetation without *V. longifolia*, whereas a few minutes later a male

of *A. longifoliae* was found on *Veronica longifolia* at a distance of only 15 meters. Apparently *A. circularis* and *A. longifoliae* do not mix, but occupy their own niche within the same area.

Veronica longifolia (fig. 3) is a scarce plant in the Netherlands which mainly occurs in two isolated areas, one in the province of Overijssel and one in the province of Noord-Brabant (fig. 4, Weeda 1985). Within both areas, *V. longifolia* is found only in small groups, often separated from each other by a distance of several hundreds of meters. Sites in other provinces in figure 4 mostly refer to adventive plants. Apparently *A. longifoliae* succeeds in migrating between many of these patches, as often only single sawflies were observed on each locality of the host plant. On the other hand, one large fertile vegetation of *V. longifolia* was visited by me several times in 1996-1997 and again in 2009, without finding any *A. longifoliae*. This locality (near Vught, Amersfoort-coördinates 143.3-409.0) is situated about 3.5 km west of the westernmost locality of *V. longifolia* occupied by *A. longifoliae*. Although there are no obstacles between both localities that prevent migration, apparently the distance of 3.5 km is too large for *A. longifoliae* to bridge this gap.

DISCUSSION

It is often difficult to decide whether small differences between specimens indicate taxonomical differences or just insignificant variation, especially when only few specimens from various origin are available. The observations mentioned above, however, are based on large series of specimens which permit conclusions on a population level. They strongly indicate that *A. longifoliae* and *A. circularis* must be regarded as sibling species: strongly related and very much alike, but reproductively isolated. The main reasons for this conclusion are:

1. The morphological differences between *Athalia* found on *Veronica longifolia* and the other specimens of the *A. circularis*-complex in the Netherlands are small, but constantly present. No intermediates were found, although there are no physical barriers in the Netherlands that would prevent hybridisation. There is no barrier in time as well, as the flight periods completely overlap (fig. 18-19). A status as subspecies for both taxa can be excluded therefore, as the main character of subspecies is an incomplete reproductive isolation when populations meet.
2. Both taxa appear to have their own ecological niche within the same geographical area. *Athalia longifoliae* lives monophagous on *Veronica longifolia*. *Athalia circularis* apparently occupies other plants as a food source. Random sampling on 20 different localities of *Veronica longifolia* resulted in 89 specimens of *A. longifoliae*, all found within a distance of 1-2 meters from this plant, and only a single specimen of *A. circularis* at about 15 meters away from the nearest *Veronica longifolia*. On all other localities throughout the country, where no *V. longifoliae* was growing, only *A. circularis* was found, often in large numbers.
3. *Athalia longifoliae* is not just a local form. It inhabits a large area, ranging from southern Finland (Kontuniemi 1951), through the Netherlands, Germany (this study) and

western France (Bretagne, Normandie) up to the most southern part of France (dep. Aude) (Chevin 1969), showing constant distinguishing features throughout this area.

4. The phenotypic variation rate of the colour of the mesopleura appears to be larger in populations of *A. circularis* than in *A. longifoliae*. This phenomenon was already mentioned by Chevin (1969) and confirmed by the present study. It may be caused by a different genotypic variation rate between both taxa, indicating that *A. circularis* could be older (having more time to develop genetic variation) than *A. longifoliae*.

Veronica longifolia has always been a scarce plant in the Netherlands, mainly restricted to a few river valleys within the areas shown in figure 4. During the past decades the number of sites has seriously decreased, mainly due to intensive land use and manuring of grassland. This habitat fragmentation may not only mean a serious threat for this handsome plant, which is legally protected since 2002. It may even be a larger threat for *A. longifoliae* as distances between groups of plants may become too large to cross and to maintain a stable population. *Veronica longifolia* is reared as a garden plant in the Netherlands, though not very commonly. But I found no evidence so far that these garden plants could provide a refuge for *A. longifoliae*.

ACKNOWLEDGEMENTS

The author wishes to thank Jaap van der Linden (Sint-Michielsgestel), Hugo van der Wolf (Nuenen), Dré Teunissen (Vlijmen), Frans Post (Tilburg) and Piet Bremer (Zwolle) for their help in finding localities of *Veronica longifolia* and his wife Tineke Cramer for the photo of *Veronica longifolia*. FLORON provided the data on *Veronica longifolia*, used in fig. 4.

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SAMENVATTING

Athalia longifoliae, sp. rev., stat. nov., nieuw voor Nederland en Duitsland (Hymenoptera: Tenthredinidae)

De bladwesp *Athalia longifoliae* Kontuniemi, 1951 leeft als larve op lange ereprijs *Veronica longifolia*. Sinds de beschrijving in 1951 is dit taxon afwisselend beschouwd als afzonderlijke soort, als ondersoort of als synoniem van *A. circularis* (Klug, 1815). Gegevens afkomstig van 19 vindplaatsen in Nederland en één vindplaats in aangrenzend Duitsland, laten zien dat *A. longifoliae* en *A. circularis* kleine, maar constante verschillen vertonen in de structuur van de genitalia. Bovendien bezetten beide taxa een eigen ecologische niche. *Athalia longifoliae* leeft uitsluitend op lange ereprijs, terwijl *A. circularis* nooit op deze plant is gevonden, maar zich onder andere voortplant op beekpunge *Veronica beccabunga*, mannetjes-ereprijs *Veronica officinalis* en hondsdrif *Glechoma hederacea*. Om die redenen worden *A. longifoliae* en *A. circularis* als afzonderlijke soorten beschouwd. *Athalia longifoliae* is bij ons alleen gevonden op groeiplaatsen van lange ereprijs in de stroomgebieden van de Overijsselse Vecht (Overijssel) en de Dommel (Noord-Brabant). *Athalia longifoliae* loopt kans om op termijn uit ons land te verdwijnen als de optredende areaalversnippering van lange ereprijs blijft voortduren. De zustersoort *A. circularis* is een algemene soort die in het hele land kan worden aangetroffen.

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